NCCS System Environment

COMPUTE

"Discover" Supercomputer

- 3,906 compute nodes
- 43,624 Intel Xeon processor cores
- 64 NVIDIA Tesla M2070 GPUs with 28,672 "streaming GPU" CUDA cores
- 240 Intel Many Integrated Core (MIC) co-processors
- InfiniBand interconnect
- 96.136 TB main memory
- 832.27 teraflops peak

STORAGE

Mass Storage Archive

SGI Front-End
- Parallel DMF managed
- SGI Xeon Cluster
- 960 TB disk

Oracle Hardware
- 37 PB capacity
- T10K tape drives
- 9310, SL8500 tape libraries

Shared Storage
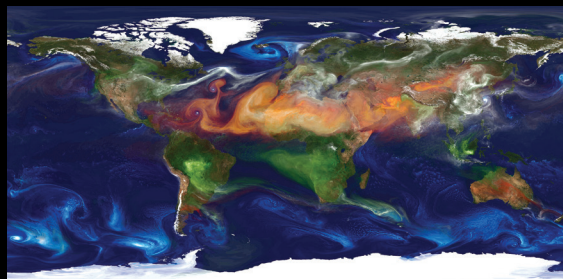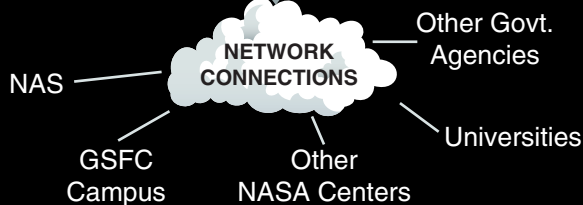
- 7.7 PB
- GPFS managed
- nobackup/scratch filesystems

USER INTERFACE

Analysis & Visualization

Dali: 272 Xeon cores; 24 NVIDIA Tesla M2070 GPUs with 10,752 "streaming GPU" CUDA cores; 4.3 TB memory

Software Tools
- ESGF/CDAT, IDL, ParaView
- Matlab, GrADS, ferret

Data Portal

HP Blade Server
- 128 CPUs
- 128 GB main memory
- 270 TB network storage (GPFS)
- NFS served to compute hosts

Software Tools
- IDL, Matlab, GrADS
- ESGF Node
- Web services
- scp, ftp, bbftp

NETWORK CONNECTIONS

NAS

Other Govt. Agencies

GSFC Campus

Other NASA Centers

Universities

For More Information:

Dr. W. Phillip Webster

NCCS Project
Computational and Information Sciences
and Technology Office
Code 606

NASA Goddard Space Flight Center
Greenbelt, MD 20771

http://www.nccs.nasa.gov

http://www.twitter.com/NASA_NCCS

High-Performance Computing at Goddard Space Flight Center

NCCS
NASA Center for Climate Simulation

www.nasa.gov

NCCS

Who We Are

The NASA Center for Climate Simulation (NCCS), located at NASA Goddard Space Flight Center, is a High-End Computing (HEC) facility that provides a range of supercomputing and data services to scientists throughout NASA's Science Mission Directorate (SMD). NCCS is part of the NASA HEC Program, together with its sister facility, the NASA Advanced Supercomputing (NAS) facility located at NASA Ames Research Center (ARC).

NCCS is funded by SMD. Scientists request supercomputing resources from NASA Headquarters as part of the scientific proposal process via programs such as ROSES, MAP, NEWS, AURA, etc. Based on the specific needs of each science project, SMD allocates NCCS and/or NAS hours depending on the types of computing services required.

Our User Community

NCCS supports modeling and analysis activities for SMD users in Earth, space, and solar research including:

- *Atmospheric modeling* for climate and weather research
- *Ocean modeling* for climate, chemistry, and biology
- *Land surface modeling* for agriculture, land use, and water resource management
- *Space and solar modeling* for fundamental physics and astronomy, space weather, and gravitational wave studies
- *Coupled models* and *systems of models* in support of collaborative science efforts
- *Observing system studies* to enhance the use and design of space instruments

NCCS Support Services

Computing
- Multiple large-scale high-performance clusters
- Tools for job scheduling & monitoring
- Portal to National Leadership Class System at NASA/ARC

Data Archival & Stewardship
- Large-capacity storage
- Tools to manage and protect data
- Data migration support

Code Development
- Environment for code development & test
- Code repository for collaboration
- Code porting & optimization support
- Earth System Modeling Framework (ESMF) assistance

Networks
- Internal NCCS high-speed interconnects for HEC components
- Center high-bandwidth access to NCCS for GSFC-based users
- Multi-gigabit network supports on-demand data transfers between NCCS and NAS

Analysis & Visualization
- Interactive analysis environment
- Software tools for image display
- Easy access to data archive
- Specialized data visualization support
- Data visualization wall

Data Sharing
- Capability to share data & results
- Supports community based development
- Facilitates data distribution and publishing

User Services
- Help Desk
- Account support
- User teleconferences
- Training & tutorials